

This listing of claims will replace all prior versions, and listings, of claims in the application:

LISTING OF CLAIMS:

Claim 1 (Currently Amended): An attenuating phase shift mask blank for use in lithography comprising:

a substrate comprising a quartz or fluorinated quartz material;

an etch stop layer deposited on said substrate comprising a metal selected from groups II, IV, V, transition metals, lanthanides and actinides, said etch stop layer exhibiting improved etch selectivity;

a phase shifting layer disposed on said etch stop layer, the phase shifting layer comprising a composite material of formula $A_wB_xN_yO_z$, where A is an element selected from the group consisting of Groups IVA, VA, or VIA; and B is selected from the group consisting of an element from Groups II, IV, V, the transition metals, the lanthanides and the actinides;

wherein w is from about 0.1 to about 0.6, x is from about 0 to about 0.2, y is from about 0 to about 0.6, and z is from about 0 to about 0.7; and

said phase shift mask blank being capable of producing a photomask with substantially 180° phase shift and an optical transmission of at least 0.001% at a selected wavelength of <500nm.

Claim 2 (Canceled).

Claim 3 (Original): An attenuated phase shift mask blank according to claim 1, wherein the phase shifting layer comprises a silicon/titanium/nitrogen/oxygen composite.

Claim 4 (Currently Amended): An attenuating phase shift mask blank according to claim 3, wherein said silicon/titanium/nitrogen/oxygen composite has structural formula $\text{Si}_w\text{Ti}_x\text{N}_y\text{O}_z$ wherein w is about 0.1 to about 0.6, x is from about 0 to about 0.2, y is from about 0 to about 0.6, and z ~~as is~~ is from about 0 to about 0.7.

Claim 5 (Original): An attenuating phase shift mask blank according to claim 1, wherein the phase shifting layer has a thickness of from about 400 Å to about 2000 Å.

Claim 6 (Currently Amended): An attenuated phase shift mask blank according to claim 1, wherein the etch stop layer comprises a material selected from the group consisting of a metal or a composite material where the composite material comprises a material selected from the group consisting of a metal, an element from Groups II, IV, and V, Nitrogen and Oxygen.

Claim 7 (Original): An attenuated phase shift mask blank according to claim 6, wherein the etch stop layer comprises a material selected from the group consisting of titanium and tantalum.

Claim 8 (Original): An attenuating phase shift mask blank according to claim 6, wherein the etch stop layer has a thickness of from about 50 Å to about 500 Å.

Claim 9 (Original): An attenuating phase shift mask blank according to claim 1, wherein the phase shifting layer is SiTiO and the etch stop layer is Ta .

Claim 10 (Original): An attenuating phase shift mask blank according to claim 1, wherein the phase shifting layer is SiTiO and the etch stop layer is Ti.

Claim 11 (Currently Amended): A method of fabricating an attenuating phase shift mask blank for use in lithography comprising:

providing a substrate comprising a quartz or fluorinated quartz material;
disposing a thin layer of etch stop layer on said substrate comprising a metal selected from groups II, IV, V, transition metals, lanthanides and actinides, said etch stop layer exhibiting improved etch selectivity;

disposing a layer of phase shifter layer on said substrate etch stop layer, the phase shifting layer comprising a composite material of formula $A_wB_xN_yO_z$, where A is an element selected from the group consisting of Groups IVA, VA, or VIA; and B is selected from the group consisting of an element from Groups II, IV, V, the transition metals, the lanthanides and the actinides; wherein w is from about 0.1 to about 0.6, x is from about 0 to about 0.2, y is from about 0 to about 0.6, and z is from about 0 to about 0.7;

said blank is capable of producing a photomask with 180° phase shift and an optical transmission of at least 0.001 % at a selected wavelength of <500nm.

Claim 12 (Canceled).

Claim 13 (Original): A method according to claim 11, wherein the phase shifting layer comprises a material selected from the group consisting of a silicon/titanium/nitrogen composite and a silicon/titanium/nitrogen/oxygen composite.

Claim 14 (Original): A method according to claim 11, wherein said silicon/titanium/nitrogen/oxygen composite has structural formula $Si_wTi_xN_yO_z$ wherein w is from about 0.1 to about 0.6, x from about 0 to about 0.2, y is from about 0 to about 0.6, and z is from about 0 to about 0.7.

Claim 15 (Original): A method according to claim 11, wherein the phase shifting film is formed by sputter deposition from two or more targets of different compositions using a technique selected from the group consisting of RF matching network, DC magnetron, AC magnetron, pulsed bipolar DC magnetron and RF diode.

Claim 16 (Original): A method according to claim 15, wherein the phase shifting layer is formed by sputter deposition from a target of a composite material ($Si_{1-x}Ti_x$) wherein x is from about 0 to about 0.5 by a method selected from the group consisting of RF matching network, DC magnetron, AC magnetron, pulsed bipolar DC magnetron, Ion beam assisted deposition, Ion beam sputter deposition and RF diode.

Claim 17 (Original): A method to claim 15, wherein the substrate is disposed in a holder which can be either planetary or stationary and/or rotating or non-rotating.

Claim 18 (Original): A method according to claim 11, wherein the phase shifting film is formed by sputter deposition from two or more targets of different compositions using a technique selected from the group consisting of RF matching network, DC magnetron, AC magnetron, pulsed bipolar DC magnetron, Ion beam assisted deposition, Ion beam sputter deposition and RF diode.

Claim 19 (Original): A method according to claim 18, wherein said two or more targets are selected from the group consisting of SiO_2 targets and Ti targets, or $(\text{Si}_{1-x}\text{Ti}_x)$ targets wherein x is from about 0 to about 0.5 and Ti targets.

Claim 20 (Original): A method according to claim 18, wherein the substrate is disposed in a holder which can be either planetary or stationary and/or rotating or non-rotating.

Claim 21 (Currently Amended): A method according to claim 1, wherein the substrate is annealed at elevated temperature in an atmosphere selected from the group consisting of air, oxygen, ~~vacuum~~ a vacuum and a mixture of gases selected from the group consisting of O_2 , N_2 , H_2 , Ar, Kr, Ne, He, O_3 and H_2O .

Claim 22 (New): An attenuating phase shift mask blank according to claim 1, wherein said etch selectivity is greater than 10:1 with substrates of quartz or fluorinated quartz and at the same time have stable optical transmission against chemical cleaning and photon irradiation.

Claim 23 (New): A method according to claim 11, wherein said etch selectivity is greater than 10:1 with substrates of quartz or fluorinated quartz and at the same time have stable optical transmission against chemical cleaning and photon irradiation.